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No. III.

JUNGLE SILK.

Report on Jungle or Wild Silk.

On the 5th January, 1802, was read in the Linnean Society (and afterwards published in the seventh volume of their *Transactions*) a paper by Dr. Roxburgh, entitled "An Account of the Tusseh and Arrindy Silk-worms of Bengal." From this paper the following particulars are derived :—

Phalæna Paphia, called Bughy by the natives of the Burbhoom Hills, where its silk, called by the same people Tusseh, is manufactured, is a native of Bengal, Bahar, Assam, &c. It feeds on the leaves of *Rhamnus jujuba* (*Byer* of the Hindoos), and of *Terminalia alata glabra*, Roxb. (*Asseen* of the Hindoos). The silk of this insect, which is very abundant in Bengal and the adjacent provinces, has afforded to the natives from time immemorial a supply of a most durable coarse dark-coloured silk, commonly called Tusseh silk.

The coccoon is produced in December, and is distinguished at once from all others by terminating in a stem about two inches long, at the end of which is a loop; both the stem and loop are of the same substance as the membrane that incloses the chrysalis, only exceedingly dense and compact, resembling a dried animal tendon. By this loop, the chrysalis is suspended from a twig of the tree, on the leaves of which it had fed while in the larva state. Another kind of worm, called jarroo, produces its coccoon in January, and the silk is of a darker colour than that of the bughy. Both the above kinds of coccoons were kept by Dr. Roxburgh till they produced their respective moths; and, after minute investigation, no differences, except a slight one in size, were discovered between them; the bughy and jarroo are therefore considered by Dr. Roxburgh as, at most, only varieties of the same species.

Phalæna Cynthia, known to the Hindoos by the names arrindy or arundi, is found only in the interior of Bengal, namely, in the districts of Dinagepore and Rungpore, where it is bred in a domesticated state, like the common silkworm. It feeds entirely on the leaves of the *Ricinus communis* or *Palma-christi*, called by the natives of those districts, arrindy. The coccoon is spindle-shaped, very soft, and of a white or yellowish-white colour. The filament is so exceedingly delicate, that it cannot be wound off like common silk, but is spun like cotton. The yarn thus made is woven into a coarse kind of white cloth, of a seemingly loose texture, but incredible durability. The cloth must always be washed in cold water; if put into boiling water, it becomes quite rotten, so that it will tear to pieces with the least effort.

In 1837, the Society received from the Agricultural and Horticultural Society of India some very interesting samples of wild or jungle silk, both raw and manufactured, sent from Gowahatty in Lower Assam by Captain Jenkins, the British resident. These samples consisted of two species of silk, one produced by the worm of the Moongha-tree, and the other from a worm which feeds on the *Ricinus communis*, and is called Area silk, being probably the same as the Arrindy silk of Dr. Roxburgh.

A notice of these samples was published in the fifty-first volume of the Society's *Transactions*. To the information there communicated, the Committee have now to add, that in 1839 some further small samples of Moongha, Area, and Tussur silks were received from Capt. Jenkins, together with some additional particulars. From these it appears, that the Moongha silk is the produce " of the *Saturnia Assamensis*, an insect only found as yet in Assam. It is fed principally on plants of the order *Laurineæ*, one or two species of *Laurus*, and three or four species of *Tetranthera*." The most common of these is often called the Moongha-tree, from its being reserved solely for feeding this worm. " It is probable that the China Tussur alluded to by Mr. Princep, in his memoir on the Assam silks in the *Asiatic Journal*, is the produce of the same worm as the Assam worm."

" The Tussur silk is the produce of the *Saturnia paphiensis* (*Phalæna paphia* of Roxb.), an insect common to the hills east and west of Bengal."

" The Eria, or rather Eri,* silk is the produce of the *Phalæna cynthia*, and is to be had throughout Rungpore and Dinagepore, as well as Assam. There is no worm producing silk so hardy or so easily managed as this; and the tree it feeds upon, the castor-oil plant, being so readily grown throughout India, could we succeed in sending home its silk in a state adapted to the English manufactures, we should not fail to strike out a profitable trade from one of our own products that has hitherto been almost valueless."

The samples received were:—

1. A small piece of cloth made from the silk of the

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* " Eria is rather the refuse of the Moongha, and Eri the silk of the *Phalæna cynthia*. They are often mixed."

worm which feeds on the leaves of the castor-oil plant: from Dinagepore.

2. A small sample of the silk of the Moongha worm which feeds on the leaves of the Maizanharry plant: from Assam.

3. A small skein of Tussur silk, and a small piece of cloth made from the same: from Bancorrah.

4. A specimen of Tussur from Bhauglepore.

Thus the whole of the samples in possession of the Society are as follows:—

I. Moongha silk, from Assam.
—— common raw silk.
—— raw silk of superior quality and lighter colour, having, apparently, been boiled off.
—— the same, wound off by experienced hands.

The general character of this silk is that it has considerable lustre, a light-brownish-red colour, is very elastic and harsh to the feel, or, in other words, contains much gum. But the sample, No. 2, of those last received is much softer and of paler colour than the others.

At the desire of Mr. Aikin, the Secretary, a portion of the common raw Moongha silk was allowed him for the purpose of experiment. This was divided into two parts; one of which was boiled in two separate portions of common brown soap and water. The result was that the silk was much improved in softness and lustre; the colour also was very much paler, though still far from white. The other part was steeped in a cold (nearly saturated) solution of borax, then boiled in the same, and being afterwards washed in clean water, was steeped for two hours in moderately strong liquid sulphurous acid; being then again washed, it was treated with borax and sulphurous acid as before. The specimen, in softness and lustre, was equal to silkworm silk, and was much improved in colour, though by no means white.

Of the manufactured Moongha silk there are two pieces: one, common cloth, worn by the lower classes in Assam; the other, a superior cloth, worn by the higher ranks. For the characters of these cloths, and the effect produced on them by boiling in soap and water, the Committee refer to the notice inserted in the fifty-first volume of the *Transactions*.

II. Area silk.

Raw silk of three different shades of colour; one with but little lustre, and the other two with scarcely any: the whole from Assam.

Of these three samples, the first, on account of its lustre and its reddish hue, is probably a mixture of Area with the refuse of Moongha, as stated by Captain Jenkins in the preceding note.

A sample of the darker coloured of the two latter kinds of Area silk was first boiled by the Secretary in a solution of borax, and then steeped in sulphurous acid, in the same way as the Moongha raw silk had been treated. The result was, that the colour became a pale-yellowish white, and the lustre was considerably increased; the harshness of its feel had also been entirely removed.

Of the two pieces of Area cloth from Assam, one is stout, harsh to the feel, with scarcely any lustre, and considerably resembles nankeen. The other is of a much looser texture, has some lustre, and a soft, silky feel. The sample last received from Dinagepore is in quality about intermediate between the two preceding. For the effect of boiling with soap and water on the Assamese cloths, the Committee refer to the already-mentioned notice in the fifty-first volume. Samples of each were also submitted to the action of borax and sulphurous acid, but without obtaining any marked superiority over those which had been boiled in the usual way.

III. Tusseh, or Tussur, silk.
Raw silk, from Bancorrah.
—— from Bhauglepore.
A small sample of Tussur cloth from Bancorrah.

Both samples of raw silk are of a pale hair-brown colour, feeling more like flax than silk. Compared with common raw silk, they would be considered as very deficient in gum.

The sample of cloth appears to be a very good and useful taffeta.

All these samples are too small to allow any satisfactory experiments to be made on the effect produced by boiling.

A member of the Committee stated, that cloths from the various kinds of wild silk of Bengal had been found almost unsaleable in the English market, on account of their want of lustre, and the impossibility of bleaching them by the common processes — that they are used by British residents in India in their natural state for children's dresses,* being well adapted to this use from their cheapness, their exceeding durability, and their property, in common with other animal fibres, of being much less combustible than cotton. He further stated, that within the last year several pieces had been sent to Paris on speculation, where they were used in their unbleached state for covering ladies' parasols, and had met with an extensive sale. He also gave in the following paper, drawn up by a friend of his, who is well acquainted with this branch of commerce : —

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* The same gentleman presented from a friend of his a child's frock made of Tussur silk, which, after having been worn for some time in India, has been since worn in England by two children in succession, and is still in very good condition. Its colour is that of nankeen, but yellower.

" Up to the year 1835, very little of the Tussur cloth was received in England. In that year 158 pieces were imported, and the quantity has gradually increased. For a long time the trade could find no use to apply it to: they thought it too harsh for dresses, and knew not what else it was fit for. In the early part of last summer, tempted by the lowness of the price, they used it for covering parasols; and it answered so well that an instantaneous demand sprung up, and prices advanced. The prices have lately been from eleven shillings to eleven shillings and sixpence for ten yards and a-half, twenty-seven inches wide; and from twenty-three shillings to twenty-three shillings and sixpence for twelve to twelve and a-half yards, from fifty-six to fifty-eight inches wide. The following is an account of the number of pieces imported since 1835 : —

" 1835	158 pieces.
1836	830 —
1837	2647 —
1838	4249 —"

Among the specimens of Tussur cloth exhibited to the Committee was one which, when boiled for a short time in soap and water, became entirely rotten, being pulled to pieces by the smallest force when wet, and crumbling to powder when rubbed between the hands after being dried. This, no doubt, was made of a silk similar to, or the same as, the Arrindy silk of Dr. Roxburgh, mentioned in the early part of this Report; though quite different in this respect from the Arrindy silk of Assam, which, either in its raw or manufactured state, is not in the least injured by long-continued boiling.

The Committee recommend, that copies of the above Report be sent to the Chairman of the Court of Directors of the East India Company, and to the Agricultural and Horticultural Society of India.